COMMONWEALTH OF KENTUCKY

BEFORE THE ENERGY REGULATORY COMMISSION

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In the Matter of

APPLICATION OF KENTUCKY POWER COMPANY FOR APPROVAL OF CAPACITY AND ENERGY EMERGENCY CONTROL PROGRAM	))))	CASE NO. 7666

O R D E R

On November 20, 1979 Kentucky Power Company (KPC) filed its application for approval of Capacity and Energy Emergency Control Programs.

The matter was set for hearing on June 5, 1980 at 10:00 a.m., Eastern Daylight Time in the Commission's offices at Frankfort, Kentucky. The hearing was held as scheduled and two parties were allowed to intervene, namely, Consumer Intervention Division of The Attorney General's Office and the Kentucky Department of Energy (KDOE). The KDOE entered testimony into the record in which they supported the concept of contingency electric curtailment plans being incorporated into an electric utility's tariff prior to the onset of an emergency. At the conclusion of the hearing the Commission ruled that another hearing would be appropriate in order to allow publication of a notice of the hearing so that the KPC customers would have an opportunity to participate in the proceedings.

The second hearing was scheduled for and held on July 15, 1980 at 10:00 a.m., Eastern Daylight Time in the Commission's offices at Frankfort, Kentucky. There were no additional intervenors and at the conclusion of the hearing the matter was submitted to the Commission for a ruling on the merits of the case.

The Commission, after consideration of the application and all evidence of record and being advised is of the opinion and finds:

1. That the emergency plans proposed by KPC comply with the general requirement that they give due consideration to the public health, safety and welfare without undue prejudice or disadvantage to any customer;

2. That while KPC is in itself an operating utility within Kentucky and under the jurisdiction of the Commission it is also one of several operating utility subsidiaries of American Electric Power Company, Inc. (AEP) and which as part of an interstate utility system is centrally dispatched out of one office and therefore it is desirable to operate under a contingency plan which is coordinated insofar as possible with other operating utilities within the AEP system, and;

3. That it is prudent and desirable to have contingency plans available prior to the onset of an emergency condition.

IT IS THEREFORE ORDERED that the emergency procedures for Declining System Frequency and for a Generating or Transmission Capacity Deficiency as listed in Exhibit No. 1 of the application be approved as submitted.

IT IS FURTHER ORDERED that the emergency procedures for a condition whereby there is a shortage of fuel for generating electrical energy as listed in Exhibit No. 1 of the application be approved with the following additions and/or changes:

(a) Add the following paragraph as the initial statement of the "procedures" section:

In the event an "emergency" is anticipated by the company, the utility shall make an inventory of their fuel stock to determine the quantity and quality of the recoverable fuel. This inventory shall be completed 30 days prior to the anticipated emergency.

(b) In the "procedures" section the term KPC shall be substituted for "AEP System" wherever it appears.

(c) The procedure for calculating the remaining days of operation of coal-fired generation as described in Appendix E, Exhibit No. 1 of the application shall be deleted and the method described in Appendix "A" which is attached to and is made a part of this Order shall be the method used for calculating the remaining days of operation.

IT IS FURTHER ORDERED that within twenty (20) days of the receipt of this Order that Kentucky Power Company shall file a new or revised tariff with the Commission which incorporates the Emergency Control Programs authorized in this Order.

Done at Frankfort, Kentucky, this 17th day of September, 1980.

ENERGY REGULATORY COMMISSION

Chairman

Vice Chairman

Commissioner

ATTEST:

Secretary

APPENDIX "A"

Appendix to an Order of the Energy Regulatory Commission in Case No. 7666 dated September 17, 1980.

The procedure described herein will be used to project the day's coal supply remaining for a system or group of systems and to determine the dispatch required to obtain the maximum days' burn from that supply.

Data Required

1. All long-time unit deratings and partial outages
2. The weighted average net heat rate (BTU/KWH) of the units within each plant (weighted by unit capability)
3. The recoverable inventory of coal in storage at each plant (TONS)
4. The heat value (BTU/lb) of the coal in storage at each plant
5. The system's projected average daily coal-fired generation requirements for the coming 60 days (MWH/DAY)
6. Additional output obtainable at each plant by the firing of supplemental fuel; i.e., oil, natural gas, propane

Algorithm Used

1. A burn factor (TON/MWH) is calculated for each plant based on the weighted average heat rate of the plant and the heat value of the coal in storage.

$$\text{TON/MWH} = \frac{\text{BTU/KWH} \times 1000\ \text{KWH/MWH}}{\text{BTU/lb} \times 2000\ \text{LB/TON}}$$

2. The maximum 24 hour MWH output of each plant is calculated considering long term deratings and partial outages.

$$\text{MAX MWH/DAY} = (\text{PLANT CAP-DERATE}) \times 24$$

3. The MWH/DAY output obtainable from the coal in storage at each plant is calculated for 10 days, 15 days, and so on to 75 days. If supplemental fuel output is available, it is to be included.

$$\text{MWH/DAY} = \frac{\text{TONS IN STORAGE}}{(\text{TONS/MWH}) \times \text{DAYS}} + \text{SUPP. MWH/DAY}$$

4. After each calculation of MWH/DAY is made, the value is compared to the MAX MWH/DAY. If the value calculated is greater, the MWH/DAY for that number of days is set equal to the MAX MWH/DAY.
5. The MWH/DAY obtainable for 10 days from each of the systems's plants is summed, then from each of the plants for 15 days, 20 days, and so on. The value of each summation is the MWH/DAY output of the system's coal-fired generation obtainable for that number of days.
6. The system's projected daily average coal-fired generation requirement in MWH/DAY is obtained by estimating the system's total MWH internal load requirement, minus firm purchase, plus firm sales, minus generation from non-critical fueled units and dividing the value obtained by the number of days over which the estimate was made.

$$\text{MWH/DAY} = \frac{\text{LOAD} + \text{SALES} - \text{PURCHASE} - \text{NON-CRITICAL FUEL}}{\text{DAYS}}$$

7. The MWH/DAY generation requirement determined in Step 6 is then compared to the total system MWH/DAY obtainable for specified days as determined in Step 5. The days remaining coal supply are the days at which the MWH/DAY generation requirement equals the MWH/DAY obtainable. If the indicated days remaining supply differs significantly from the number of days used to obtain the average MWH/DAY in Step 6, Step 6 should be repeated.

To realize the days remaining coal supply determined in Step 7, a system's generating plants must be dispatched such that each plant's daily net energy output (MWH/DAY) when averaged over a calendar week approximately equals the MWH/DAY obtainable from that plant for the number of days determined to be the system's days coal supply. How such a dispatch is affected is best determined by each system.

Jointly owned plants will be treated on a pro rata basis. Each participant will report his share of the plant's total capacity and fuel supply as if it were at a separate location. The average MWH/DAY output requirement and days remaining coal supply of each participant's share will be determined separately.

Example:

As an example, consider a 1400 MW installed capacity hypothetical system. The system's projected average internal energy requirements are 26,400 MWH/DAY. External firm sales obligations are 1,200 MWH/DAY. The system has four generating plants, one of which is a 500 MW nuclear capable of sustained operation of 90 per cent capacity factor. The three coal plants have the capability rating, coal inventory, and heat rate shown below. No condition deratings are considered. The coal in storage at all three plants is assumed to have a heat value of 11,000 BTU/lb.

COAL FIRED PLANTS

Plant	MW Net Capability	Max MWH/DAY	Tons in Storage	Heat Rate BTU/KWH	TON/MWH
1	500	12,000	200,000	9,500	.4318
2	300	7,200	75,000	10,000	.4545
3	100	2,400	30,000	10,500	.4773

From the above data, the MWH/DAY output of each plant is calculated for 5-day increments of days fuel supply remaining and totaled for the system.

MWH/DAY FOR DAYS REMAINING

Plant	25	30	35	40	45	50
1	12,000	12,000	12,000	11,579	10,292	9,263
2	6,600	5,500	4,714	4,125	3,667	3,300
3	2,400	2,095	1,796	1,571	1,397	1,257
TOTAL	21,000	19,595	18,510	17,275	15,356	13,820

The energy requirement on the coal-fired plants is:

System internal energy requirement	26,400 MWH/DAY
Firm sale obligation	1,200 MWH/DAY
Nuclear unit output (500 x 24 x .9)	-10,800 MWH/DAY
Coal-fired output required	16,800 MWH/DAY

The coal-fired energy requirement lies between 17,275 MWH/DAY for 40 days and 15,356 MWH/DAY for 45 days. By interpolation the value for 16,800 MWH/DAY is found to be 41 days. To satisfy the loading criteria each plant's average daily output should be:

Plant 1	11,250 MWH/DAY -	93% CAPACITY FACTOR
Plant 2	4,025 MWH/DAY -	56% CAPACITY FACTOR
Plant 3	1,525 MWH/DAY -	64% CAPACITY FACTOR